



BIOLOGY HSSC-II
SECTION – A (Marks 17)

Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

حصہ اول لازمی ہے۔ اس کے جوابات ہی منظر پر دے کر نام مرکز کے حوالے کریں۔ کاپٹ کر دیں۔
لکھنے کی اجازت نہیں ہے۔ لیڈ پینل کا استعمال ممنوع ہے۔

Version No.				
4	0	0	6	1

ROLL NUMBER					

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

Answer Sheet No. _____

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔ Invigilator Sign. _____

Fill the relevant bubble against each question according to curriculum: Candidate Sign. _____

Question	Candidate Sign.							
	A	B	C	D				
Rapid melting of ice caps and glacier is due to:	Greenhouse effect	Ozone layer depletion	Acid rain	Algal bloom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pressure filtration in kidney specifically occurs in:	Glomerulus	Bowman's Capsule	Loop of Henle	Vasa Recta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The lungs are covered by doubled layer thin membranous sacs called:	Pleura	Pericardium	Peritonea	Diaphragm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the given diagram of skeletal muscle, bands i, ii and iii represent:	<p>i A band ii I band iii H-zone</p>	<p>i I band ii A band iii Z-line</p>	<p>i M-line ii Z-line iii H-line</p>	<p>i H-line ii I band iii A band</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which of the following neurotransmitters function both as neurotransmitter and hormones? Describing perception of pain.	Epinephrine	Serotonin	Dopamine	Endorphins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
After consuming banana, which hormone would be expected to increase in body?	Prolactin	Glucagon	Insulin	Parathyroid hormone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which of the following hormones would bind to receptors located on the inside of a cell.	Testosterone	FSH	Prolactin	Somatotropin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The diagram shows female reproductive system in humans. In which labelled part is zygote formed?	<p>1</p>	2	3	2 and 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which of the following will be hemophilic?	$X^{H} X^{H}$	$X^{h} Y$	$X^{H} Y$	$X^{H} X^{h}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In humans sex determination depends upon the nature of:	Heterogametic female	Homogametic female	Heterogametic male	Homogametic male	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which of the following shows evidences for evolution through molecular biology?	Development of brain in vertebrates' embryo	Distribution of species	Comparison of gene/protein in different species	Study of vestigial Organs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The cause of acid rain is:	Oxides of carbon only	Oxides of sulphur only	Oxides of nitrogen and sulphur	Oxides of nitrogen only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The enzyme used to isolate gene from DNA is:	Helicase	Reverse transcriptase	Restriction endonuclease	DNA polymerase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The agent which separates the two strands of DNA in PCR (polymerase chain reaction) is:	DNA ligase	Primer	Helicase	Heat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which of the following hormones is secreted if blastocyst is successfully implanted in the wall of uterus?	hCG	Corticosteroid	LH	Progesterone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The construction of intricate web by spider is an example of:	Insight leaning	Instinct	Latent learning	Habituation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Phosphodiester bond is:	P-O-C-P-O-C	C-O-P-O-C	C-O-P	C-C-O-P	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



BIOLOGY HSSC-II

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

SECTION – B (Marks 42)

Q. 2 Answer the following questions briefly.

14x3=42

(i)	Describe the structure of rib cage. Briefly explain the advantages of having some ribs that are not attached directly to sternum.	2+1	OR	What is the function of nephron? How is the rate of blood filtration with in the Bowman's capsule affected if blood pressure in the afferent arteriole is decreased?	2+1
(ii)	People with type I diabetes do not produce any insulin. What effect would it have on cells and metabolisms if left untreated?	03	OR	Identify and describe the three different processes involved in embryonic development.	03
(iii)	The given pedigree shows a particular trait. Analyse the pedigree and draw conclusion.	03	OR	What are chromosomes and genes? How are they related?	03
(iv)	In Griffiths experiment, do you think the heat treatment that killed the bacteria also inactivated the bacterial DNA? Why or why not?	03	OR	Differentiate between convergent and divergent evolution on the basis of inheritance of homologous and analogous structure.	03
(v)	Why is nasal breathing generally considered superior to mouth breathing? Also write down sequence of muscle contraction that takes place during inhalation and exhalation.	1+2	OR	Compare Klinefelter syndrome with Turner's syndrome with reference to Karyotype, Cause and Symptoms.	03
(vi)	FSH and LH get their names from events of female reproductive cycle but they also function in males. How their functions are similar in female and male?	03	OR	Briefly explain Darwin's theory of natural selection.	03
(vii)	Differentiate between A. Ammonification and denitrification B. Xerarch and hydarch succession	03	OR	Briefly explain Integrated disease management.	03
(viii)	Briefly describe the procedure for the construction of Genomic library.	03	OR	Compare and contrast the sympathetic and para sympathetic nervous systems.	03
(ix)	Briefly describe the following terms: A. Genetic marker B. Genomics C. Genome maps	03	OR	Local anaesthesia blocks the opening of sodium channels in the nerve cells. How this would affect the transmission of pain impulses? Explain briefly.	03
(x)	Why biomass present at one trophic level of an ecosystem decreases at higher trophic level? Explain briefly.	03	OR	How is it possible for a child to have a blood group O if the parents have blood group A and B.	03
(xi)	Write down any three applications of DNA analysis.	03	OR	What is meant by home gardening? List at least four benefits of home gardening?	1+2
(xii)	State Mendel's law of segregating. Make a cross between round seed and wrinkled seed pea plant.	1+2	OR	What are the three major steps in sequencing of DNA?	03
(xiii)	What is epistasis? How is it different from dominance?	1+2	OR	Briefly explain characterises of Growth, Distribution and Carrying capacity of a population.	03
(xiv)	Briefly explain the role of vaccination as an effective method of preventing infectious diseases.	03	OR	A plant with yellow flower was crossed with a plant with red flowers. The F1 progeny obtained had orange flowers. What is the inheritance pattern? Explain briefly.	03

SECTION – C (Marks 26)

Note: Attempt the following questions.

Q.3	Identify the labelled parts and correlate these with major events of foetus development in the first trimester.	2+4	OR	Identify the labelled parts E, F, G and H. Write down the major events of menstrual cycle in human females.	(2+4)
Q.4	Explain Habituation, Conditioning, Latent learning and insight learning by giving examples from human behaviours.	07	OR	How is the information present in DNA used for the synthesis of RNA? Explain in detail. Also list down the post transcriptional modifications of mRNA.	5+2
Q.5	What are the two methods used for gene therapy? Explain the role of successful gene therapy for cystic fibrosis.	2+4	OR	Why anterior lobe of pituitary gland is called master gland? Enlist the hormones produced by anterior gland. Write down the functions of each hormones as well.	1+2+3
Q.6	Describe the transport of oxygen and carbon dioxide through blood in humans.	07	OR	Explain in detail the Sliding filament model of muscle contraction.	07



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کلمے کی ابھارت نہیں ہے۔ سبڈ پنسل کا استعمال ممنوع ہے۔

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Answer Sheet No. _____

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Fill the relevant bubble against each question according to curriculum: Candidate Sign. _____

Question	A	B	C	D	A	B	C	D																				
The lungs are covered by doubled layer thin membranous sacs called:	Pleura	Pericardium	Peritonea	Diaphragm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
The excretory product that requires maximum water for its removal is:	Ammonia	Creatinine	Urea	Uric acid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Which of the following is correctly matched?					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
<table border="1"> <thead> <tr> <th>Sr.</th> <th>Feature</th> <th>Bone</th> <th>Cartilage</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>Blood vessels</td> <td>✓</td> <td>×</td> </tr> <tr> <td>II</td> <td>Living cells</td> <td>✓</td> <td>×</td> </tr> <tr> <td>III</td> <td>Collagen</td> <td>×</td> <td>✓</td> </tr> <tr> <td>IV</td> <td>Calcium phosphate</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>	Sr.	Feature	Bone	Cartilage	I	Blood vessels	✓	×	II	Living cells	✓	×	III	Collagen	×	✓	IV	Calcium phosphate	✓	✓	I	II	III	IV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sr.	Feature	Bone	Cartilage																									
I	Blood vessels	✓	×																									
II	Living cells	✓	×																									
III	Collagen	×	✓																									
IV	Calcium phosphate	✓	✓																									
During muscle contraction which of the regions shown in diagram decreases in length?	1 only	1 & 2 only	3 & 4 only	2,3 & 4 only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Which of the following condition best describes active membrane potential?	+++ Outside --- Inside	+++ Outside +++ Inside	---+ Outside -++ Inside	--- Outside +++ Inside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Which of the following hormones would be expected to increase, if a student reads all day and skips breakfast and lunch?	Insulin	Glucagon	Secretin	Calcitonin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Decrease of FSH and increase of estrogen, causes pituitary gland to secrete.	Somatotrophic hormone	Leuteotrophic hormone	Vassopression	Oxytocin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
In given diagram of female reproductive system. The labelled parts are:	I Ovary II Fimbrae III Oviduct IV Vagina	I Oviduct II Ovary III Uterus IV Cervix	I Uterine tube II Ovary III Cervix IV Vagina	I Uterine tube II Fimbrae III Cervix IV Vagina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
If a person has 44 autosomes +XXY, he will suffer form:	Klinefelter's syndrome	Turner's syndrome	Down's syndrome	Edward's syndrome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
If CGATAG is sequence of nucleotide in DNA strand, the mRNA strand synthesized from it would be:	GCUAUC	GCTATG	GCATAG	CGUTUC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
What limits the number of trophic level in a food chain?	Primary productivity	Efficient energy conservation	Net productivity	Species diversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Which enzyme is used to join the desired gene into plasmid DNA during genetic engineering?	DNA helicase	DNA polymerase	DNA ligase	Taq polymerase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Which of the following enzymes is temperature insensitive?	DNA Pol I	DNA Pol III	Taq Polymer	RNA Polymer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
The fluid which surrounds embryo is called:	Chorionic fluid	Amniotic fluid	Uterine fluid	Yolk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Working out a mathematical problem is an example of:	Reflex	Innate behavior	Classical conditioning	Insight learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
Large population size, random mating, no mutation and no migration are the postulates of:	Theory of special creation	Mendel's law of Segregation	Law of independent assortment	Hardy Weinberg's theorem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				
The particular array of chromosomes that an individual possesses is called:	Genotype	Phenotype	Karyotype	Wild type	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																				



BIOLOGY HSSC-II

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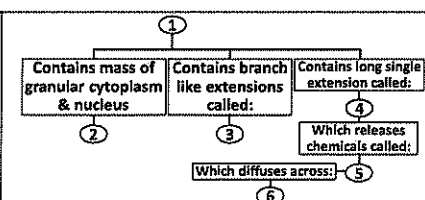
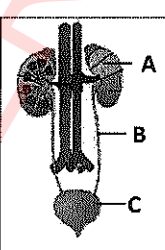
Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

SECTION – B (Marks 42)

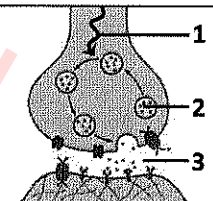
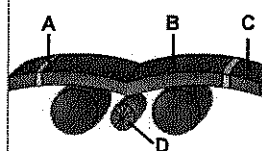
Q. 2 Answer the following questions briefly.

14x3=42

(i)	If people do not have ligaments, what would happen to them? Compare tendons with ligaments.	1+2	OR	Explain the role of bacteria in nitrogen cycle.	03
(ii)	Complete the concept map by using the given terms: <ul style="list-style-type: none"> Neurons Cell body Neurotransmitter Axon Dendrites Synapse 	03	OR	Identify the organs A, B and C in the figure of the urinary system. Write function of each as well. 	03
(iii)	Dead S-strain bacteria injected into mice did not harm the mice; but when mixed with living non-virulent R-strain bacteria, it killed them. Why?	03	OR	A colour-blind father has a daughter with normal vision. The daughter marries a man with normal vision. What is the probability of her children to be colour-blind? Explain with the help of pedigree chart.	03
(iv)	Describe the path an oxygen molecule takes as it travels from nose to body cell. (Enlist each structure of respiratory system through which it passes.)	03	OR	What is gene mutation? Briefly explain the causes and symptoms of Sickle cell anaemia as an example.	1+2
(v)	What are the functions of male reproductive system? What might happen to sperm production if a male has a high fever?	2+1	OR	How is sewage treated? (Write down the three stages of sewage treatment process briefly.)	03
(vi)	Why is an embryo most vulnerable to drugs and other harmful substances taken by mother if it is between 2 to 7 weeks old? Also state how a foetus gets nourishment from mother.	03	OR	Differentiate between: I Nucleosome & Primosome II Heterochromatin & Euchromatin III Sense codon & Non Sense codon	03
(vii)	How would the inheritance pattern of an X linked dominant trait be different from that of X linked recessive trait?	03	OR	"Migration may increase or decrease the effect of selection." Comment on the statement.	03
(viii)	How does inheritance of homologous and analogous structures result in convergent and divergent evolution?	03	OR	What is animal husbandry? Briefly state the role of livestock in national economy.	1+2
(ix)	Discuss the role of microbes in industrial production.	03	OR	Draw a flow chart to show how hormones control the function of male reproductive cycle.	03
(x)	Briefly explain the process of gene amplification through PCR (Polymerase Chain Reaction).	03	OR	Briefly explain polygenic inheritance.	03
(xi)	Compare the anchorage dependent and anchorage independent techniques of animal cell culture.	03	OR	How inhaled air in the respiratory tract is cleaned before it reaches the lungs? Describe briefly.	03
(xii)	Briefly explain haematoma formation. How is callus made during repair of bone structure?	1+2	OR	What is drug addiction? Write down any two effects of drug addiction on central nervous system (CNS).	1+2
(xiii)	How kidneys help in maintaining homeostasis in the body? (Write role of kidney briefly)	03	OR	Briefly explain the principle and process of Gel electrophoresis.	03
(xiv)	Describe the antagonistic effect of insulin and glucagon.	03	OR	Briefly explain any three methods of plant breeding for crop improvement.	03

SECTION – C (Marks 26)

Note: Attempt the following questions.

Q.3	The diagram shows how neurons communicate. Name the process and identify the parts 1, 2 & 3. Explain the whole process in detail. 	2+4	OR	What is meant by innate behavior? Describe different types of orientation and non-orientation behavior with examples.	1+5										
Q.4	The diagram shows the neurulation in human embryo. Identify the labelled parts and state events of neurulation. Enlist the structures derived from neural crest cells. 	2+4+1	OR	Describe the components of recombinant DNA technology under the following headings: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>(i)</td> <td>Gene of interest</td> </tr> <tr> <td>(ii)</td> <td>Molecular scissor</td> </tr> <tr> <td>(iii)</td> <td>Molecular glue</td> </tr> <tr> <td>(iv)</td> <td>Molecular carrier</td> </tr> <tr> <td>(v)</td> <td>Expression system</td> </tr> </table>	(i)	Gene of interest	(ii)	Molecular scissor	(iii)	Molecular glue	(iv)	Molecular carrier	(v)	Expression system	07
(i)	Gene of interest														
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(iii)	Molecular glue														
(iv)	Molecular carrier														
(v)	Expression system														
Q.5	Why multiple alleles provide many different phenotypes for a trait? Explain with the help of ABO blood group system.	06	OR	Explain ecological succession. Write in detail about kinds of succession.	2+4										
Q.6	Describe the mechanism of breathing in humans. How is breathing controlled? Explain in detail.	5+2	OR	Discuss the concept of genetic drift. Also describe speciation and different modes of speciation.	3+4										